THE SHOW-ME TECHNOLOGY PLAN

Mapping a Brighter Future

THE SHOW-ME TECHNOLOGY PLAN
Mapping a Brighter Future

Published by the Missouri State Board of Education

TABLE OF CONTENTS

Americans have engaged in many efforts to reform teaching and learning over the past 25 years. Some important successes have been achieved, but gains often were limited to individual schools or a single part of the system. Lasting, across-the-board improvement will depend on educators, parents, and communities coming together in a nation-wide partnership to improve schools. That premise is the foundation upon which the Goals 2000: Educate America Act was built. We have learned from experience–always the best teacher–that the keys to better schools are:

★ High expectations for all students

★ An engaging, challenging curriculum

★ Active involvement by parents and communities

★ Safe learning environments

★ Meaningful, ongoing teacher education and professional development

★ Flexibility for innovation

★ Accountability for results

The Goals 2000 Act addresses these crucial elements in eight national education goals and presents states with an opportunity to strengthen and broaden their reform efforts by developing coordinated, flexible, grassroots-based education plans. Missouri has accepted the challenge. The National Goals (Appendix A) address issues related to:

★ School readiness

★ School completion

★ Student achievement and citizenship

★ Mathematics and science

★ Adult literacy and lifelong learning

★ Safe, disciplined, and alcohol- and drug-free schools

★ Teacher education and professional development

★ Parental education

The Missouri State Board of Education convened concerned citizens from all walks of life to serve on a Goals 2000 State Panel and a separate Technology Task Force. They were to develop a state plan for educational improvement and a technology plan. The process was neither smooth nor simple. Panel members argued and debated, agreed and disagreed. When the subcommittee reports were complete, there was a new challenge, that of molding the reports into a single, workable document that the state and schools could use as a blueprint for school improvement. The Show-Me Plan: A Process for Educational Improvement was approved by the State Board of Education in December 1995. This Technology Plan is the companion piece to that initial work.

The Task Force hopes that educators and other community members will be provided access to the rationale, recommendations, and considerations included in this plan. An awareness of the variety of ways in which technology can support the educational and economic health of Missouri communities should expand local support for technology and learning.

PURPOSE

To guide and facilitate state and local technology planning

BACKGROUND

Approximately one year before Congress enacted the Goals 2000: Educate America Act (Goals 2000), Missouri enacted comprehensive educational reform legislation known as the Outstanding Schools Act (OSA). In addition to focusing on educational funding equity and adequacy, the OSA contains many provisions designed to stimulate systemic educational improvement. A prime provision of both Acts is the development and adoption of state performance standards and assessments aligned to those standards.

Missouri has recently developed the Show-Me Standards. Those standards establish the minimum knowledge base, skills, and competencies necessary for students to become capable and contributing adults. The standards incorporate what students should know and be able to do. Performance assessments aligned with the standards are being developed. Because the assessments require students to apply what they know in a variety of ways, such as demonstrations, presentations, and projects, teachers must be prepared to provide learning and teaching environments to build the knowledge base and skills necessary to succeed on those assessments. Technology can provide the management of the learning system, expand the availability and variety of learning resources, and connect learning to skills needed in the workplace. Technology will assist schools in the teaching, learning and assessment process.

Given the general agreement of the legislation, it was not necessary for Missouri to chart a new direction to comply with the Goals 2000 federal legislation. Goals 2000 provided the means to develop a comprehensive state plan designed to implement the state's knowledge, skills, and performance standards and other educational improvement initiatives across the state. To begin the process of plan development, Governor Carnahan and the State Board of Education appointed a Goals 2000 State Panel and a Goals 2000 Technology Task Force. These two committees were drawn from a representative sample of educators, business people, parents, and community members to develop a state improvement plan and a state technology plan.

The committees looked at a variety of improvement and technology plans developed by other groups around the state. They decided that the Show-Me Plan and the Show-Me Technology Plan should help school personnel better understand how the variety of plans might fit together and to identify good ideas and existing resources which could assist in developing and implementing local improvement and technology efforts.

Goals 2000 is a voluntary program. The Goals 2000 State Panel and Technology Task Force never intended to develop a narrow set of strategies and considerations that the state and all school districts would follow in lock-step fashion. They did intend to identify a variety of successful major initiatives and resources that were already in place and to recommend alternative improvement strategies that are not currently in place in most schools, but that, in their opinion, the state and schools should consider if they are to meet the needs of all students.

RATIONALE

There are many reasons for promoting the educational use of technology. Four of the most prominent are: educational equity, educational enhancement, work force preparation, and state and local economic health.

EQUITY

Missouri's schools vary in size from the very small (fewer than 100 students) to fairly large (greater than 40,000 students). Within this size range, schools are located in wealthy and poor communities, some of which are rural, suburban, or urban. In this diverse environment, it is difficult to assure that all students are provided an equal opportunity to a quality education. Missouri's Outstanding Schools Act helps assure equity by establishing a base of equalized educational funding. Technology is a means to help assure a quality education for all students because it can bring the same advantages to all students regardless of location, race, ethnicity, language of origin, wealth, or family background.

For example, rural schools receiving language minority students could obtain in-service training and student instruction through a variety of technologies.

Figure 1

This diagram shows the relationship of the state plans to other plans and initiatives. It relates:

1) how the Goals 2000 federal legislation and OSA state legislation directly impact the state plans,

2) the consideration of other plans in developing the state plans, and

3) how the state plans become the central plans to feed into the refining of current plans or the development of future plans.

For example, elements of the Commission on Informational Technology (CIT) plan were incorporated into the Show-Me Technology Plan. As school districts review and refine their local technology plans, they should use the Show-Me Technology Plan as a resource for new ideas and strategies and for alternative funding sources.

Federal Legislation Goals 2000

State Legislation Outstanding Schools Act

Performance Standards and Assessments

Show-Me State Plan
Show-Me Technology Plan

DESE Strategic Plan

MSIP

CIT/MOREnet Local Technology Plans

IASA/ESEA School-to-Work Adult Education Vocational

CSIP/Goals 2000 Local Improvement Plan
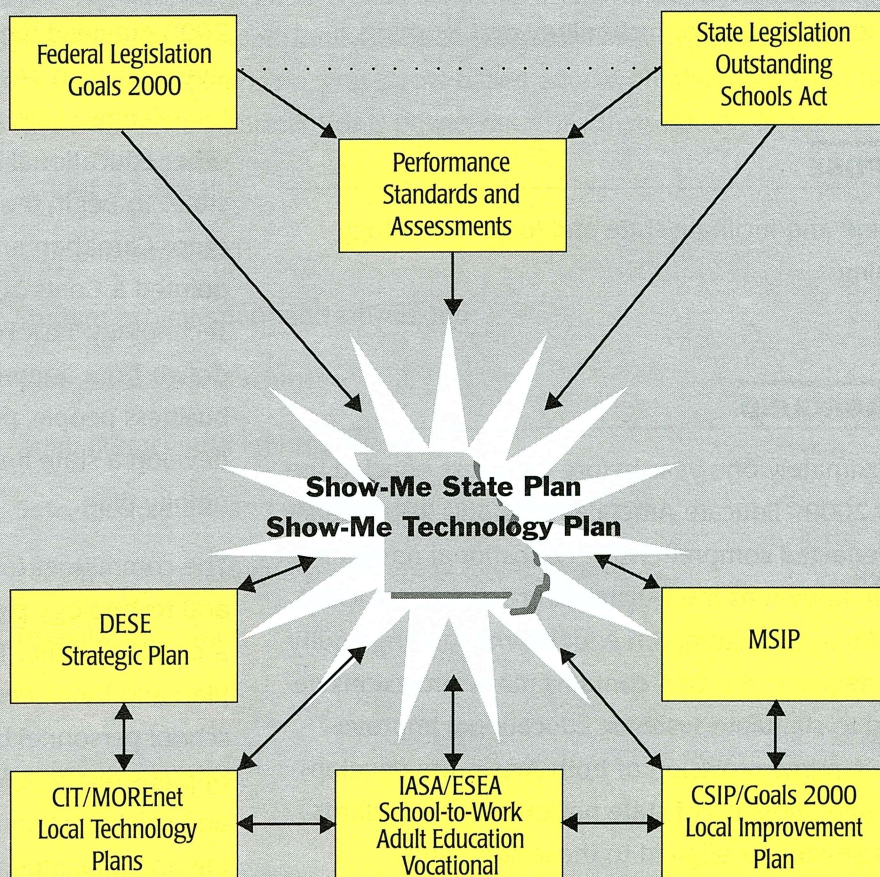
Through an extensive satellite network and the cooperation of the public television stations, the Video Instructional Development and Educational Opportunities program has helped provide statewide access to educational programs, professional development, instructional demonstrations, courses of instruction, teleconferencing, and information sharing. Two-way interactive television and statewide connections to the Internet can make even greater strides in assuring access to quality instruction and a variety of data and information that otherwise would be inaccessible.

Missouri schools are supported in buying technology and gaining access to the Internet through special funding recommended by the Governor and approved by the General Assembly. These State initiatives should demonstrate how technology can help provide equity in education. Technology can help achieve equity among the schools by:

- permitting easier and faster access to grant program information and applications

- promoting shared educational data, information, and research statewide

- providing alternative education opportunities for economically disadvantaged, limited English, homebound, and geographically isolated students

- facilitating professional development and instructional demonstrations (e.g., TEAMS project)

- making available course offerings to remote and sparsely populated locations (satellite and two-way interactive television)

- accessing on-line information and reference materials, such as periodical databases and Internet resources

EDUCATIONAL ENHANCEMENT

The Show-Me Standards, curriculum frameworks, and aligned assessments acknowledge that students learn

Figure 2: Process for Educational Improvement
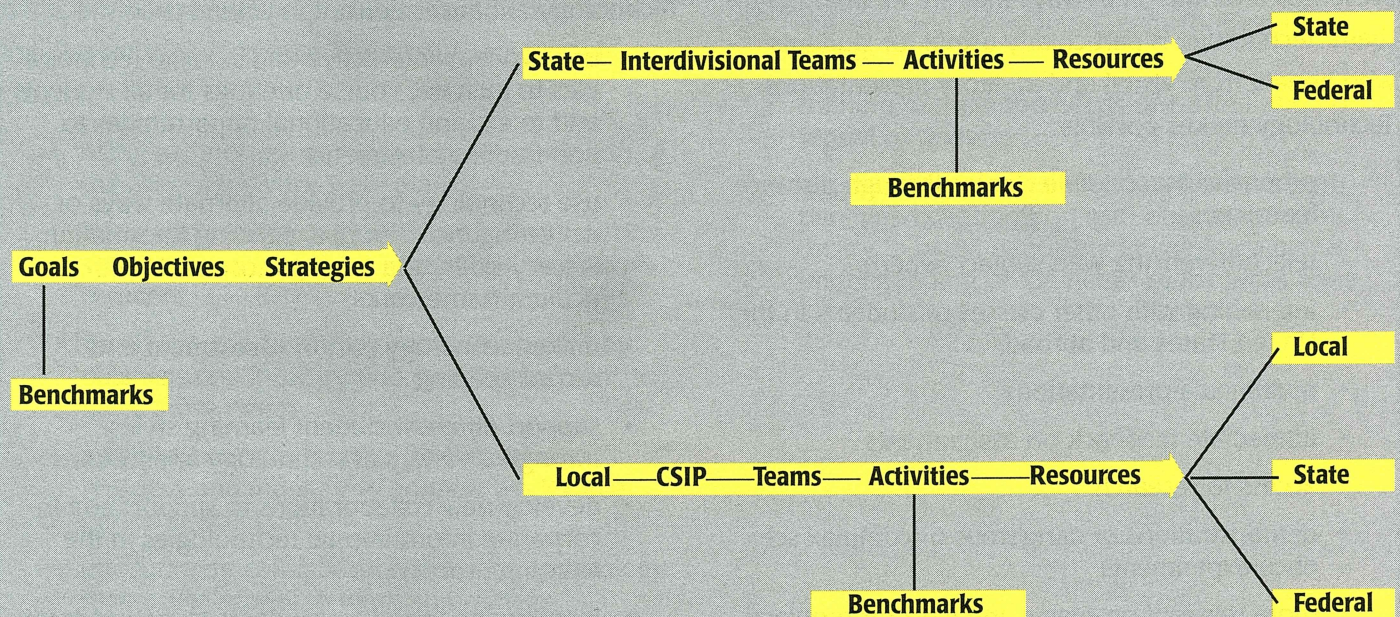
This diagram attempts to show how the process for implementing the recommendations from the Show-Me Technology Plan should flow at the state and local levels. On each level, considerations should be selected for adoption and implementation. Subcommittees may be assigned to develop the action plan to ensure the successful implementation of the considerations. The subcommittees will identify activities to accomplish, establish benchmarks to gauge progress, and identify resources that could be accessed to implement those activities.

and demonstrate knowledge in a variety of ways. Technologies can help teachers accommodate the learning and presentation styles of each student, keep students on task, provide individualized assistance, and support students who must be absent from classes. Technology has the potential for enhancing education in three important areas: 1) teaching, 2) learning, and 3) doing.

Teaching: Instruction is enhanced when teachers are able to more easily accommodate learning and assessment styles. Technology can help teachers provide real-time data and information, improve and vary their presentations, safely and economically present a broad range of science experiments, receive immediate feedback from students, and pull library and research resources into the classroom. Technology can help build teaching skills as teachers participate in cooperative teaching projects, such as TEAMS, and access research and professional development activities through the satellite- and instruction television-delivered workshops.

Learning: Learning is enhanced when students are presented information in ways that are meaningful to them. Technology is particularly useful for students who benefit from visual and auditory presentations. Technology makes possible:

- otherwise inaccessible classes through distance learning
- teleconferencing with subject experts
- interacting with other classes of students in the United States and abroad
- multimedia presentations
- immediate feedback on assignments
- access to research
- demonstrations of dangerous or complex science experiments
- more relevant problems and data for problem solving
- an expanded library of resource materials

The increased access to resources and varied activities should result in improved student achieve-

ment in the core subject areas (including mathematics and science). Technology also expands the options for increased parental involvement and contact with the schools directed at improved student achievement.

Doing: Technology allows educators to modify the ways students process, organize, and interact with information and resources. Many students benefit by being able to interact with instructional materials in a variety of ways and settings. The Internet facilitates homebound and evening instruction and thus improves the chances of school completion. Electronic media also facilitates and adds variety for students working together on projects in their homes and accessing experts located outside of their communities. The computer provides a variety of interactive strategies including:

- drill and practice
- tutorial and guided instruction
- ease of organizing data through spreadsheets and databases
- ease of editing

Technology enhances education when schools:

- use two-way interactive and satellite technologies to increase course offerings for all students and to expand educational opportunities to non-traditional students
- use technology to provide alternate ways of delivering instruction, expanding information literacy skills, and linking those skills with curriculum frameworks
- make technology part of assessment and record keeping
- support different student learning styles through a variety of technology applications
- develop new collaborations to support and incorporate informational technologies in the learning process
- identify and introduce students to current informational and applied technologies available in business, industry, and education
- develop program initiatives that address high dropout rates by providing alternative school programs with more emphasis on applied course work and technical preparation

- provide opportunities for learners to become proficient users of learning technologies and to use technology for personal and professional growth

- use technology to blend curricular content areas

- employ technology to support programs allowing alternative ways to meet graduation requirements

- use information networks to integrate real-life application projects throughout the curriculum

- access on-line information and reference materials such as periodical databases and Internet resources

WORK FORCE PREPARATION

A high percentage of jobs (a survey of workers estimated as high as 80 percent) require an understanding of or use of technology. While work force preparation is not the prime purpose of public education, it certainly must be considered if Missouri students are to have enjoyable and productive lives and if Missouri is to remain an economically healthy state. Technology can play a major role in assuring that students are adequately prepared for continuous learning and for the workplace. Successful activities include:

- using technology to support implementation of the School-to-Work state plan

- integrating technology with programs assisting students moving from a school to a work environment

- identifying the technological skills needed by business and industry and developing plans to meet those needs

- establishing collaborative partnerships with business and industry to address work force performance issues

- encouraging collaboration between technology teams and school-to-work committees

ECONOMICS

On average, approximately one-half of the funding of local schools comes from local and county resources. This fact makes schools very dependent on the economic health of the local communities. It is in the best interests of the schools and the communities to develop and implement collaborative strategies to share technology and training that might maintain and enhance opportunities for community economic expansion and improve customer service. Activities on which schools and communities might work together include:

- facilitating access of local businesses to training and teleconferencing

- developing community technology plans that support economic growth and that include the schools as a resource

- increasing the literacy levels of the community

- training the adult population in ways technology can enhance their standard of living

- collaborating to create access to the learning technologies of community resources, such as schools, libraries, and museums

- identifying the skills needed by business and industry and developing plans to meet those needs

- training to meet the needs of current and potential businesses

- encouraging professional development partnerships/collaboration with business and industry to assist educators in gaining a better understanding of the needs of the work force

STATE POINTS OF CONSIDERATION

The Missouri Department of Elementary and Secondary Education (DESE) must develop and implement technology strategies on two fronts. First DESE must ensure that the state education agency is technologically positioned to take advantage of the efficiency created by technology and to interact with other agencies and the schools. Second, the Department has a responsibility to provide leadership and technical assistance to school districts so they are positioned to make the best use of technology for educational and administrative purposes.

A. Planning Process—To assist the Department in its planning efforts, the state panel recommends the following:

1. establish a coalition that identifies and expands upon each agency, organization, foundation, or corporation to provide resources for planning that meets the mutual technology needs for the local, regional, and state levels

2. work with the state Office of Information Technology to:

    - recommend telecommunications standards

    - facilitate and coordinate the development and implementation of a statewide strategic technology plan

    - identify and encourage private/public partnerships

    - enhance communication, collaboration, and technology funding among state and local education agencies and institutions of higher education, Regional Professional Development Centers (RPDC) and Missouri communities

    - expand opportunities for learning technology resource sharing (ex., joint purchasing of periodicals, equipment, access to databases)

3. promote the establishment of a statewide research, development, evaluation, and dissemination function for learning technologies

4. support regulatory policies that:

    - support flexibility in the Public Service Commission's decision-making process

    - establish education as a priority user of technology

    - unbundle rates so educators can shop for the least expensive telecommunications services at the component level

    - are consistent for all local exchange carriers

5. promote professional development in the area of technology through the Missouri School Improvement Plan (MSIP)

6. establish a statewide board/body to discuss and make recommendations on the issues surrounding technology-related certification needs for all teachers and administrators

7. ensure that state and federal grant programs support recommendations included in this state technology plan

8. ensure that the needs of children with disabilities are included in state and local planning

9. promote collaboration with ongoing projects

10. work with the Coordinating Board for Higher Education and other state agencies with a responsibility for and interest in education to:

    - identify and propose new sources of funding for educational technology

    - maintain current sources and levels of funding for educational technology

    - organize funding mechanisms that streamline access to technology support, while maintaining funding-source diversity

    - develop mechanisms to help local education agencies allocate and track, on an ongoing basis, a portion of their funds for technology applications (ex: free textbook monies)

    - identify and develop resources to help local education agencies plan, budget, and implement learning technology more effectively

    - encourage continuous reviewing and updating of local technology plans

- provide statewide dissemination of technology training opportunities and model programs using technology for instructional purposes

B. Technical Standards—To assist the Department in assuring an effective and efficient technology system, the state panel recommends the following:

1. develop a set of voluntary technical standards for schools that include discussions regarding:

   - access
   - equipment
   - training needs
   - teacher competencies
   - student competencies
   - equipment life span

2. organize and publicize statewide, cost-efficient opportunities for schools to purchase instructional and administrative technology equipment

3. revise state teacher certification requirements related to technology education

4. develop a standard for the Missouri School Improvement Program requiring schools to support a full-time technology coordinator (or shared time with other districts)

5. expand current delivery mechanisms to include interactive technologies

C. Training—To assist the Department in assuring personnel are adequately prepared to use technology, the Technology Task Force recommends the following:

1. use technology to conduct training

2. provide training that supports the Show-Me Standards

3. help Professional Development Committees (PDC) to understand the need for professional development in the area of technology

4. use the RPDCs as technology information clearinghouses

5. encourage technology training through RPDCs and other service providers

6. plan and implement a systematic, statewide professional development program to help educators become more proficient at under-

standing and using learning technologies and that addresses training issues such as:

- quality
- quantity
- variety of programs and providers
- programs that address all learners

7. provide intensive summer technology workshops for teachers

8. disseminate successful programs/projects/trainers information electronically (MOREnet, MORE-Tech, ESN, interactive television networks, and community information networks) and through print materials

9. keep teachers informed about current and emerging learning technologies

D. Technical Support & Maintenance—To assist the Department in assuring that users receive the support necessary for an effective and efficient technology system, the state panel recommends the following:

1. provide ongoing technical support for technology-dependent information and retrieval systems, such as Core Data and Grant Program Application

2. establish an electronic help desk for all new or amended software applications linked between the DESE and school districts

3. encourage the development of responsive systems of equipment and software maintenance throughout the state

E. Community Partnerships—To assist the Department in expanding the use of technology beyond the schoolhouse doors, the Technology Task Force recommends the following:

1. expand the community-based technology network structure

2. encourage local initiatives for non-traditional learning environments and hours

3. develop a model community learning plan

4. promote the linkage of community colleges, colleges and universities, career education centers, business and industry, community agencies, school districts, and state and local agencies

F. **Administration**—To assist the Department in promoting the effective use of instructional and administrative technology, the Technology Task Force recommends the following:

1. purchase software for statewide implementation to facilitate the transfer of data between the DESE and the school districts

2. increase the use of technology to administer and process school district program applications

3. take a leadership role in promoting the use of educational and administrative technology

4. develop, collect, organize, and distribute a significant database of information and resources to support statewide learning technologies

5. disseminate information about successful technology programs and innovative demonstration projects via the DESE Internet Server, community information networks, interactive television networks, and print media

6. demonstrate the use of learning technologies in efficient, effective school administration and classroom management

G. **Budgeting**—To assist the Department in assuring the financial support necessary to develop and maintain an efficient and effective technology system, the Technology Task Force recommends the following:

1. develop a multiyear technology plan and budget for DESE that considers issues such as:

   • funding sources

   • new equipment needs

   • replacement equipment needs

   • equipment maintenance

   • technical support needs

   • professional development needs

   • reallocating existing resources

   • future technologies

   • providing on-line information resources

2. request budgetary support for the multiyear plan

3. assist districts in accessing statewide purchasing contracts

4. set aside state funds for professional development in technology-related areas for DESE and school personnel

5. establish incentives to adapt or adopt existing exemplary technology-related programs

6. establish technology grant programs where extra points are awarded to applications that collaborate and extend the learning community

7. maintain current and propose new sources of funding for local educational technology to ensure that all learning facilities have access to current and emerging technologies

8. develop mechanisms to help local education agencies identify potential funding sources and allocate and track a portion of their funds for technology applications

9. identify and develop resources to help local education agencies plan, budget, and implement learning technology more effectively

10. provide access to technical assistance

Funding Sources—State Points of Consideration

	Planning Process										Technical Standards					Training								
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5	6	7	8	9
FEDERAL PROGRAMS																								
Title I*									✓		✓	✓				✓		✓	✓	✓	✓		✓	
JTPA	✓	✓	✓						✓							✓	✓						✓	
JTPA—Dislocated																✓								
FUTURES																✓							✓	
Learn & Serve	✓	✓							✓															
School-to-Work Planning	✓							✓	✓		✓					✓	✓	✓					✓	✓
Vocational* State Leadership	✓	✓	✓		✓		✓	✓	✓	✓						✓	✓	✓			✓	✓	✓	✓
Vocational.—Tech. Prep. III-E	✓		✓		✓						✓	✓	✓	✓	✓	✓								
Special Education—K-12	✓	✓			✓	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IDEA—Professional Develop.						✓					✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Medicaid																								
STATE PROGRAMS																								
Gifted Education																							✓	✓
Incentives for School Excellence						✓																	✓	✓
Video						✓										✓						✓	✓	✓
Tech. Aquisition						✓																		
Competitive Tech.						✓																	✓	✓
Instructional Tech. Entitlement						✓																		
Instructional Tech. Endeavor						✓																	✓	✓
ESL Support Grants																					✓			
FL Support Grants																					✓			
A+ Schools																								
Caring Communities		✓			✓		✓					✓				✓			✓		✓			
Special Ed./Early Childhood	✓	✓	✓				✓	✓			✓					✓		✓		✓			✓	✓

* Title I includes: LEA, By Pass, Capital Expenses/Priv., Program Improvement, Even Start, Migrant/Part C, Neglected/Delinquent

* Vocational Includes: Industrial Education, Agricultural Education, Business Education, Family and Consumer Science Education, Marketing and Cooperative Education

Funding Sources—State Points of Consideration

	Technical Support & Maintenance			Community Partnershps				Administration						Budgeting									
	1	2	3	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10
FEDERAL PROGRAMS																							
Title I*									✓	✓				✓									
JTPA					✓		✓						✓	✓										
JTPA—Dislocated																								
FUTURES																								
Learn & Serve														✓										
School-to-Work Planning					✓		✓						✓	✓										
Vocational* State Leadership					✓		✓				✓		✓	✓										
Vocational.—Tech. Prep. III-E																								
Special Education—K-12	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓			✓		✓	✓				✓
IDEA—Professional Develop.							✓				✓	✓	✓			✓	✓	✓			✓	✓	✓
Medicaid							✓																
STATE PROGRAMS																							
Gifted Education									✓	✓		✓								✓	✓		
Incentives for School Excellence					✓								✓	✓					✓				✓
Video				✓	✓		✓						✓	✓					✓			✓	✓
Tech. Aquisition					✓															✓		✓	✓
Competitive Tech.				✓	✓		✓						✓	✓					✓				✓
Instructional Tech. Entitlement					✓														✓				✓
Instructional Tech. Endeavor				✓	✓		✓						✓	✓					✓				✓
ESL Support Grants																								
FL Support Grants																								
A+ Schools																								
Caring Communities				✓	✓		✓		✓				✓									✓	✓
Special Ed./Early Childhood	✓						✓			✓				✓							✓	✓	✓

* Title I includes: LEA, By Pass, Capital Expenses/Priv., Program Improvement, Even Start, Migrant/Part C, Neglected/Delinquent

* Vocational Includes: Industrial Education, Agricultural Education, Business Education, Family and Consumer Science Education, Marketing and Cooperative Education

LOCAL POINTS OF CONSIDERATION

If the rationale for fully integrating technology into the instructional and administrative processes of schools is valid, districts must plan for the development and continuous support of the system.

A. **Planning Process—**Any school wishing to fully benefit from technology must develop a plan that assesses the district's current technology capabilities, describes and prioritizes the intended uses of technology, and provides strategies, activities and potential funding sources for implementing and maintaining the plan. Appendix A includes Using Technology in Missouri Schools—A Planning Guide. The guide was developed through the efforts of the DESE State Special Instructional Programs Section to assist schools and school districts in their planning efforts. In developing or reviewing their technology plans, the Technology Task Force recommends the following:

1. create district- and building-level technology teams to assess, plan, implement, and evaluate technology status and needs

2. include the community in the planning process

3. identify informational technologies and resources that strengthen the learning process

4. include the needs of children with disabilities in local technology plans

5. encourage examination and evaluation of existing projects

6. include short- and long-range goals and priorities in local technology plans

7. plan to use technology to integrate curriculum, instruction, library, and administrative needs

8. collaborate with ongoing projects

9. ensure that grant requests support the state and local technology plans when appropriate

10. support legislation that provides equal access to learning technologies for all students

B. **Technical Standards—**To assist school districts in assuring an effective and efficient technology system, the Technology Task Force recommends the following:

1. develop and implement local technical standards for technology that consider issues such as:
   - access
   - equipment
   - teacher competencies
   - student competencies
   - equipment life span

2. identify reliable vendors who accommodate and support adopted technical standards

3. locate equipment to provide easy access for classroom utilization

4. provide learning stations, systems, and learning technology tools for learners and educators

5. expand the use of the existing satellite infrastructure to deliver programming, especially in rural areas

6. expand current delivery mechanisms including distance learning and two-way interactive technologies

C. **Training—**To assist school districts in assuring personnel are adequately prepared to use technology, the Technology Task Force recommends the following:

1. emphasize training that supports the Show-Me Standards

2. keep teachers informed about current and emerging learning technologies

3. use Professional Development Committee (PDC) monies for professional development in technology-related areas

4. encourage and support faculty and staff to utilize training and the development of programs available in their region, especially through the Regional Professional Development Centers

5. emphasize on-site training

6. identify and use alternative training mechanisms

7. provide training for technical support staff

8. plan for time and resources necessary to support staff in acquiring technology skills

9. provide opportunities for learners to become proficient users of learning technologies and to use technology for personal and professional growth

10. use technology as part of training

D. **Technical Support & Maintenance—**To assist school districts in assuring that users receive the support necessary for an effective and efficient technology system, the Technology Task Force recommends the following:

1. ensure the availability of technical support for all district personnel

2. ensure the availability of a responsive system of equipment and software maintenance and support

E. **Community Partnerships—**To assist school districts in expanding the use of technology beyond the schoolhouse doors, the Technology Task Force recommends the following:

1. create linkages to community colleges, colleges and universities, career education centers, vocational education institutions, business and industry, community and state agencies

2. use existing coalitions of local, state, and national PTAs/PTSAs to provide information to parents on technological opportunities for home, community, and school use

3. explore greater use of telecommunications to meet parents' needs and to promote parental involvement

4. develop a community learning plan

5. offer non-traditional time frames and learning environments so that teachers, students, and the community may have access to technology

6. promote access to portable technologies (laptop computers)

7. develop collaborative internships for teachers in local businesses to acquire practical technological knowledge

8. identify key business and industry representatives to participate in partnership activities

F. **Administration—**To assist school districts in promoting the effective use of instructional and administrative technology, the Technology Task Force recommends the following:

1. take the lead in developing, demonstrating, and implementing the use of technology for effective and efficient school administration and classroom management

2. effectively utilize available database information on training programs

3. form regional (district) technology teams that receive technical and staff support from regional professional development centers

G. **Budgeting—**To assist school districts in assuring the financial support necessary to develop and maintain an efficient and effective technology system, the state panel recommends the following:

1. develop a multiyear (long-range) technology plan and budget that considers:

   - funding sources
   - new equipment needs
   - replacement equipment
   - equipment maintenance
   - technical support needs
   - professional development
   - reallocating existing resources

2. institute efficient purchasing practices

Funding Sources— Local Points of Consideration

	Planning Process										Technical Standards						Training									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10
FEDERAL PROGRAMS																										
Goals 2000	✓	✓	✓	✓	✓	✓	✓		✓		✓					✓	✓			✓	✓	✓				
Title I*				✓	✓				✓		✓	✓		✓			✓		✓	✓	✓					
Title II—Prof. Development																	✓		✓	✓	✓	✓				
Title VI—Innovations		✓				✓	✓	✓			✓		✓	✓	✓	✓	✓		✓	✓			✓	✓		✓
JTPA		✓	✓	✓	✓			✓	✓		✓	✓	✓				✓									✓
Learn & Serve		✓	✓	✓	✓			✓	✓		✓	✓	✓				✓			✓	✓					✓
School-to-Work Planning		✓	✓	✓	✓			✓	✓		✓	✓	✓				✓	✓		✓	✓					✓
Vocational* Title II—Part C	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Vocational.—Tech. Prep. III-E	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Special Education—K-12		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓	✓	✓	✓
IDEA—Part H				✓				✓						✓												
IDEA—Prof. Development																	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
STATE PROGRAMS																										
Gifted Education									✓						✓		✓			✓	✓	✓			✓	✓
Incentives for School Excellence	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
Video	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓
Tech. Aquisition	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
Competitive Tech.	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓		✓				✓	✓	✓	✓	✓	✓	✓
Instructional Tech. Entitlement	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
Instructional Tech. Endeavor	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
Parents as Teachers		✓			✓		✓	✓				✓						✓		✓						✓
Professional Development (Local)															✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
A+ Schools	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Caring Communities		✓	✓	✓	✓			✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special Ed./Early Childhood		✓		✓			✓	✓	✓		✓	✓	✓						✓	✓					✓	✓

* Title I includes: LEA, By Pass, Capital Expenses/Priv., Program Improvement, Even Start, Migrant/Part C, Neglected/Delinquent

* Vocational Includes: Industrial Education, Agricultural Education, Business Education, Family and Consumer Science Education, Marketing and Cooperative Education

Funding Sources—
Local Points of Consideration

	Technical Support & Maintenance		Community Partnerships								Admin.			Budget	
	1	2	1	2	3	4	5	6	7	8	1	2	3	1	2
FEDERAL PROGRAMS															
Goals 2000			✓						✓		✓			✓	
Title I*				✓	✓		✓	✓						✓	✓
Title II—Prof. Development															
Title VI—Innovations		✓													
JTPA			✓					✓							
Learn & Serve			✓												
School-to-Work Planning			✓		✓				✓	✓	✓	✓	✓	✓	✓
Vocational* Title II—Part C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vocational—Tech. Prep. III-E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Special Education—K-12			✓	✓	✓		✓	✓							
IDEA—Part H					✓	✓									
IDEA—Prof. Development									✓	✓	✓			✓	
STATE PROGRAMS															
Gifted Education					✓										
Incentives for School Excellence	✓	✓	✓	✓	✓	✓									
Video	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
Tech. Aquisition	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Competitive Tech.	✓	✓	✓		✓		✓	✓	✓	✓					✓
Instructional Tech. Entitlement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Instructional Tech. Endeavor	✓	✓	✓		✓		✓	✓	✓	✓				✓	✓
Parents as Teachers			✓	✓	✓			✓							
Professional Development (Local)	✓										✓		✓	✓	
A+ Schools	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Caring Communities			✓	✓	✓		✓	✓			✓	✓	✓		
Special Ed./Early Childhood	✓	✓	✓	✓	✓			✓						✓	✓

* Title I includes: LEA, By Pass, Capital Expenses/Priv., Program Improvement, Even Start, Migrant/Part C, Neglected/Delinquent

* Vocational Includes: Industrial Education, Agricultural Education, Business Education, Family and Consumer Science Education, Marketing and Cooperative Education

Benchmarks

Benchmarks will be established for the evaluation of the Technology Task Force Plan. The benchmarks will measure the impact of technology as they relate to the eight National Education Goals and the implementation of technology in education. Selected items to be benchmarked will provide a broad view of the progress of the plan. Qualitative and quantitative data will be collected to view the progress at the local, state, and national levels. Schools will have the option of using all or some of the benchmarks as they see fit to evaluate the district's local plan.

The development of the benchmarks will engage the following groups:

- Technology Task Force
- DESE's Technology Articulation and Collaboration Team
- DESE's Core Data Team
- DESE's Special State Programs Section
- DESE's Planning, Research & Evaluation Section

Several DESE teams are in the process of developing benchmarks that will be used by the Department to evaluate how the Department uses technology. It is felt that this type of information needs to be included in this plan. Evaluation of the benchmarks will assist the schools and DESE in fine-tuning the local plans and the state plan. Informing the public of progress will also be a result of the benchmarks.

Committee Rosters

ACCESS AND AVAILABILITY

Wesley Bird, Chair
Associate Executive Director
Missouri School Boards Association

Mark Yehle, Facilitator
Superintendent of Schools
Southern Boone Co. R-I School District,
Ashland

Tom Ogle, Recorder
Missouri Department of Elementary and
Secondary Education

Bill Bratberg
Technology Coordinator
Farmington R-VII School District

Mitch Hanna
Superintendent of Schools
Pleasant Hill R-III School District

Vicki Hobbs
Director/Education Consultant
MIT-E Network, Columbia
Catherine Jones, Economist
Missouri Public Service Commission,
Jefferson City

Bill Mitchell
Executive Director
MOREnet

Jon Rickman
Director of Telecommunications
Northwest Missouri State University

Joyce Smith
School Board Member
New Haven

BUSINESS AND INDUSTRY

Jim Tice, Chair
Superintendent of Schools
Strafford R-VI School District

Maureen Spence, Facilitator
Assistant Superintendent
Mehlville R-IX School District

B.J. Stockton, Recorder
Missouri Department of Elementary and
Secondary Education

Willie Horsely
Director of Vocational Programs
Kansas City 33 School District

Anne Linnemeyer
Director
Springfield/Greene County Libraries

Cal Owens
Director of Educational Technology
Cooperating School Districts, St. Louis

TRAINING AND TECHNICAL ASSISTANCE

Ted Rohr, Chair
Director of Telelearning Services
St. Louis Community College

Carl Grigsby, Facilitator
Principal, Eastgate Middle School
North Kansas City

Deborah Sutton, Recorder
Department of Elementary and Second-
ary Education

Lynn Beckwith
Superintendent of Schools
University City School District

Phil Brody
Director, Gateway Institute of
Technology, St. Louis

Les Clark
Vice President
Marion Merril-Dow Inc., Kansas City

Frankie Dissinger
Director, Technology Center
University of Missouri-Kansas City

Carl Hoagland
Director
Cooperating School Districts of St. Louis

David Hollingshead
Administrative Assistant of Technology
Gideon 37 School District

John Wedman
Coordinator of Technology
University of Missouri-Columbia

LEARNING TECHNOLOGIES

Michael J. Dyrenfurth, Chair
Professor of
Technology & Industry Education
University of Missouri-Columbia

David Bethel, Facilitator
Assistant Professor & Director
Northeast Missouri State University

Mike Flynn, Recorder
Missouri Department of Elementary and
Secondary Education

Rusty Rosenkoetter, Recorder
Missouri Department of Elementary and
Secondary Education

Betts (Elizabeth) Barrett
Director of Technology
Lee's Summit R-VII School District

Stephen Coffman
A+ Schools Coordinator
Osage Co. R-II School District, Linn

Curt Fuchs
Director of Media Services
Columbia Public Schools

Carolyn Neal
Principal, Airport Elementary School
St. Louis

Sheila Perry
Technology Coordinator
Bloomfield R-XIV School District

Marilyn Stone
Media Specialist
Hickman High School, Columbia

OTHERS WHO PROVIDED INPUT

Richard Mihalevich
Director
Linn Technical College

James Kyd
Technology Educator
Hickman High School, Columbia

Christopher Dede
Professor, George Mason University
Springfield, VA

Richard W. Hardt
Principal, Astra Phoenix Group
Prairie Village, KS

John Phillipo
Executive Director
Center for Educational Leadership &
Technology, Marlborough, MA

TECHNOLOGY TASK FORCE, CHAIR

Cal Owens
Director of Educational Technology
Cooperating School Districts, St. Louis

EDITORS

Stephen Barr
Stephen Coffman
Craig Rector
Marsha Taylor
Kim Thurman
Becky Kemna
Shirley Kemna

Glossary:

Access charges
Charges levied by local exchange companies for the use of the local exchange network in the origination and termination of interexchange traffic.

American National Standards Institute (ANSI)
An organization that reviews and approves product standards in the United States. In the electronics industry, their work enables designers and manufacturers to create and support products that are compatible with other hardware platforms in the industry.

Analog
A continuously varying signal, like those responding to sound, measured in amplitude (voltage or current), and cycles per second (hertz).

Application
A software program specially designed for particular user needs or the specific use of a software program.

Archie
A system for locating files that are publicly available by anonymous FTP.

ASCII (American Standard Code for Information Interchange)
The standard binary encoding of alphabetical characters, numbers, and other keyboard symbols. Pronounced as-kee.

Audioconferencing
Interactive audio communications between individuals or groups at three or more locations.

Backbone
The high traffic density portion of a communications network.

Basic rate interface
The ISDN interface standard for single-line ISDN service with a bandwidth of digital voice channels divided into 2 B channels of 64 kilobits per second for voice, data, and video; and one D channel of 16 kilobits per second that permits the user's equipment and the network to exchange control and signaling information.

Baud
When transmitting data, the number of times the medium's state changes per second. For example: a 2400-baud modem changes the signal it sends on the phone line 2400 times per second.

Bit
The smallest unit of digital storage or transmission, a 1 or a 0. A kilobit is a thousand bits, a megabit is a million bits and a gigabit is a billion bits.

Bridge
An electronic device that interconnects three or more locations, usually for audio communication using telephone lines.

Broadband
A telecommunication channel with a bandwidth of many voice channels.

Broadcast signal
Transmission of information in one direction.

Bundled rates
Rates in which the various rate elements that comprise a telecommunications service are consolidated, thereby tying them together in the marketplace.

Cable TV
A broadband transmission system that has the capacity to deliver multiple channels of programming to residential and institutional subscribers over a coaxial cable.

CD-ROM/XA
Microsoft's extension to CD-ROM that interweaves audio with data.

Central Processing Unit (CPU)
Microprocessor responsible for system control.

Circuit
A two-way telecommunications path.

CODEC
An electrical device that converts a signal into digital form to be sent through some type of transmission medium to another CODEC, where it is decoded back to its original form.

Collaborative work
Exchanging of data between two or more workers in real-time. Applications include screen sharing and videoconferencing.

Common carrier
A government regulated private company offering telecommunications services to the general public under operating rules mandated by the appropriate state and/or federal regulatory authority.

Community information network (CIN)
A local computer network providing modem and public terminal access to stored electronic local information; Internet-type communications and data processing applications; and internet access.

Compact Disc Interactive (CDI)
A home entertainment compact disc standard introduced by Philips.

Compact Disc Read-Only Memory (CD-ROM)
The ISO 9660 standard medium used by most companies.

Compressed-video system
A digital transmission technique used to reduce a normal broadband video signal into a narrowband form before transmission.

Computer-aided design (CAD)
The use of computer graphics technology to design electronic and mechanical parts and machinery.

Computer-assisted instruction (CAI)
A system in which the student receives individualized instruction by interacting with a computer.

Computer-based instructional management
Computer applications that address management and instructional activities equally rather than focusing exclusively on one or the other.

Coordinating Board for Higher Education (CBHE)
The Coordinating Board for Higher Education is responsible for statewide policy and planning for higher education.

Desktop video
The creation of videotape presentations using desktop computers and video editing software.

Dial-up
A connection to a computer made by calling the computer up on the telephone.

Digital transmission
The transmission of information in the form of 1s and 0s. Information customarily sent in this form is related to computer data traffic that is already in digital form.

Digitize
Converting an image from hard copy (such as a photo) into digital (binary) data for display on a computer. Also, converting an analog signal (voltage or temperature) into a digital value.

Direct-broadcast satellite (DBS)
A communication satellite designed specifically to transmit digital video signals directly to small rooftop receiver systems owned or leased by members of the general public.

Distance education
An educational activity in which the teacher and learner are physically separated and one or more technologies are used to exchange information between them.

Distance learning
Education that is facilitated by a communications link between educator and student. The one- or two-way exchange of information for instructional purposes accessible from remote sites, which may or may not involve the assistance of an instructor.

DOS
An operating system supported on most IBM-compatible platforms.

Downlink
The ground equipment, including a dish and other electronic components, used to receive signals from a satellite.

DS-3 channel
A high speed digital carrier with a bandwidth of 28 T-1 channels.

Educational telecommunications system
An organizational unit composed of hardware, software, a transport system, and staff who lead, manage, and use the system.

Electronic mail (E-mail)
The use of computers and terminals as message centers for users. Text and still images that are created and distributed electronically to one or more locations.

Enhanced telecommunications services
Advanced services like video and interactive video that may also include services involving the manipulation or alteration of messages and the storage, processing and retrieval of information.

Eye tracking systems
Hardware capable of following the motions of the human eye to direct the actions of user interfaces.

Federal Communications Commission (FCC)
The federal telecommunications regulator.

Fiber-optic system
A telecommunications system that transports signals by means of a pulsating beam of light over a network of glass fibers.

File servers
A dedicated processor on a LAN with sufficient storage capacity and management software to serve as a central repository for shared data files.

File Transfer Protocol (FTP)
A protocol that defines how to transfer files from one computer to another. An application program that moves files using the File Transfer Protocol.

Fractional T-1
A digital private line service that makes available less than the full 24 voice channels of a T-1 telecommunications link.

Full-motion video
A video system supporting 30 frames per second for NTSC and SECAM and 25 frames per second for PAL broadcast standards.

Gateway
A computer system that transfers data between normally incompatible applications or networks. It reformats the data so that it is acceptable for the new network (or application).

Gigabyte
1,000 megabytes or one million kilobytes of digital information.

Gopher
A menu-based system for exploring Internet resources

Hardware
The components of a computer graphics system responsible for user input, display, and mathematical processing. Often the term hardware is used in specific reference to the computing power of the CPU or the graphics accelerator, or both.

High-Definition Television (HDTV)
A video system based on twice the vertical and horizontal resolution of standard NTSC.

Hypermedia
Navigational access software in which text, graphics, audio, images and video are structured to allow for key association searches.

Icon
A tiny on-screen symbol that simplifies access to a program, command, or data file

Image processing
One of the methods used to enhance or manipulate the characteristics of a scanned or digitized image for analysis. Typical image-processing techniques include filter and thresholding.

Information services
Delivering multimedia data over local or wide area networks not in real-time. Applications include audiographics and workflow.

Input device
A hardware device that enables the user to communicate with the graphics system. Examples of input devices are keyboard, mouse, track ball, light pen, and joystick.

Instructional Television Fixed Service (ITFS)
Narrowcast television channels, assigned by the Federal Communications Commission, which require a special antenna for signal reception. One-way full motion video and audio programming is transmitted by microwave or satellite and may be enhanced by a two-way audio link for interactivity.

Integrated Services Digital Network (ISDN)
A digital telephone service. With ISDN service, the phone lines to your house are carrying digital signals, rather than analog signals. ISDN is designed to provide standard interfaces to LANs and equipment such as computers, telephones, and fax machines.

Interactive educational telecommunications system
A system that allows for some form of two-way communication between users, most often as real-time communications.

Interactive videodisc system
Computer-assisted instruction using videodiscs, which allows instantaneous changes in the lesson delivery based on student input to the system.

Interactive video
The capability to transmit and receive two-way video transmissions between two or more sites.

Interactive
The user's ability to interrupt, direct, and navigate within a multimedia environment.

Interconnection
The connection of a piece of telecommunications equipment to the telephone network, such as the interface between telecommunications service providers.

Interexchange Carrier (IXC)
Telecommunications companies that provide interLATA services or services between local exchanges without providing local exchange services.

Interface
A common boundary between two or more interconnected telecommunications equipment facilities.

InterLATA equal access
The capability to choose an interexchange carrier for interLATA service from among those wishing to serve the subscribers exchange and to reach that carrier's network with the same dialing pattern as required to reach any other carrier.

Internet
A global network of networks initially servicing university and government facilities and now being expanded for commercial and private uses. The Internet provides file transfer, remote login, electronic mail, news, and other services.

IntraLATA equal access
The capability to choose an interexchange carrier or local exchange carrier for intraLATA service from among those wishing to serve the subscribers exchange and to reach that carrier's network with the same dialing pattern as required to reach any other carrier.

Kiosk (electronic)
A small, self-contained structure housing equipment that provides access to video, audio and/or data information.

Laserdisc
Optical media containing 30 minutes of analog video or up to 54,000 individual frames of still video.

Leased line
A permanently connected private telephone line between two locations.

Live-via-satellite system
A telecommunications system based on the live transmission of signals using satellite transport.

Local Access Transport Area (LATA)
Local exchange groupings created by the Modified Final Judgment that approved the breakup of AT&T and separated the telecommunications market into local and interexchange markets. Telecommunications services that are delivered outside the originating LATA exchange group (InterLATA) must be handed off by the local exchange company to an interexchange carrier. LATA boundaries in Missouri generally follow the boundaries for area codes.

Local Area Network (LAN)
A computer network with printers, mass storage units interconnecting offices within a building or campus and usually designed to convey voice, data, fax, and video communications.

Local Exchange Carrier (LEC)
A telephone company that provides switched local telephone service within a geographic area established by a regulatory body and access to the message toll network.

Local exchange
A geographic area established by a regulatory body within which customers have the ability to originate and receive calls and to obtain access to the message toll network. Calls placed within a local exchange are local calls and are covered by the charge for basic monthly telephone service.

Local loop
A circuit connecting subscriber telecommunications equipment to a switching facility or distribution point.

Megabyte
A megabyte is 1,048,576 bytes or 1024 kilobytes; or roughly 1 million bytes or 1,000 kilobytes.

Microwave transmission
The transmission of information over distances by means of signals of microwave length.

Missouri Interactive Telecommunications Education Network (MIT-E)
One of the distance learning trial networks established by the Public Service Commission on Interactive Learning. A compressed interactive video network involving five school districts and two colleges: Bunceton, Glasgow, New Franklin, Pilot Grove, Slater, Central Methodist College in Fayette, and East Central College in Union.

Missouri Public Service Commission (MPSC)
The regulator for Missouri's local and intrastate telephone services.

Modem
A piece of equipment that connects a computer to a data transmission line (typically a telephone line of some sort).

MOREnet
The Missouri research and education network. A consortium of Missouri education, government, not-for-profit and research institutions that provide an electronic computing information network and Internet access.

Mosaic
A full screen graphics interface for Internet.

Mouse
An input device connected to the workstation that determines the location of the pointer and thus determines the active window in a window system.

Multimedia
Computer control of the combination of text, graphics, audio, video, and animation data.

Multimedia networking
Distribution of digital media over a local or wide area network.

Multimedia platforms
Computer hardware designed with integrated media capabilities.

Multiplexer (MUX)
A device used for concentrating and de-concentrating electronic signals.

Narrowcast signal
Electronic transmission of information to a specific audience rather than the general public.

Near-Video-on-Demand
The delivery of digital movies via cable, telephone, or wireless where the user has the ability to start the movie on 15-minute intervals.

Networking
The ability to connect two or more computers locally or remotely located for the purpose of communicating or sharing resources.

National Television Systems Committee (NTSC)
A standard for U.S. color broadcast using 525 horizontal lines per frame at 30 frames per second with interlaced scans.

Operating lifetime (Useful Lifetime)
A period of time that experience has shown to be the average useful time over which a device will function properly and reliably.

Origination site
The point of origin of an activity or program.

Outsourcing
Contracting for internal business activities to be supplied from outside the firm.

Pay-per-view (PPV)
A broadcast cable television service that delivers movies and special presentations on a two-hour schedule for an additional subscriber fee.

Phase Alternating Line (PAL)
The European television standard, which uses 25 frames per second.

PhotoCD
A digital image format standard developed by Eastman Kodak that specified five levels of photographic resolution.

Pixel
A picture element, the basic building block of a 2D graphic display and the unit in which display resolution is usually expressed. The smallest location on a display.

Pointer
In a window system, the arrow or other marker that indicates to the window system and to the user which window is active.

Postproduction
That portion of the video production work when the final assembly is performed and audio and other special effects are added.

Primary rate interface
The ISDN interface standard for LAN ISDN service with a bandwidth of digital voice channels divided into 23 B channels of 64 kilobits per second for voice, data, and video and one D channel of 16 kilobits per second that permits the user's equipment and the network to exchange control and signaling information.

Protocol
A definition of how computers will act when talking to each other. Standard protocols allow computers from different manufacturers to communicate; the computers can use completely different software, providing the programs running on both ends agree on what the data means.

QuickTime
Extensions to Apple Macintosh system software and APIs to perform media integration and synchronization of time-dependent information.

Radio talkback
A microwave technology that uses frequencies at the high end of the ITFS band to transmit voice communication from remote sites to the origination point of a network.

Random Access Memory (RAM)
Semiconductor memory that can be read and changed during microcomputer operation.

Real time
The accelerated graphics processing that makes objects appear to move naturally and at a speed that appears realistic. Also, the visual result of some combination of effective transformation algorithms, fine-tuning of the graphics software to the graphics hardware, double-buffering, and graphics acceleration.

Resolution
The number of pixels in the horizontal and vertical dimensions of a display, taking into account the size of the display and thus the size of the pixels. Also, the number of elements per unit length available for display or printing by a particular device.

RGB color
RGB color systems obtain their colors via a direct combination of red, green, and blue components. The range of colors that can be displayed depends upon the number of bits that have been assigned to each pixel.

Read-Only Memory (ROM)
Semiconductor memory that can be read but not changed during microcomputer operations.

Router
A system that transfers data between two networks using the same protocols. The networks may differ in physical characteristics (e.g., a router may transfer data between an Ethernet and a leased telephone line).

S-VHS (Super VHS)
A high-resolution video recorder with 400 horizontal lines.

Satellite
An electronic retransmission device, which is normally placed in orbit above the Earth in a geosynchronous orbit (having a constant position above one spot on Earth).

Scanner
A hardware device that converts a hard copy image, such as a photograph, into digital data for display on a graphics system.

School-to-Work
A system based on true education, business, and community partnerships that offers all students options and opportunities in school-based learning, work-based learning, and with connecting activities.

Sequential Color with Memory (SECAM)
A broadcast standard developed in France and adopted by the former USSR and parts of the Middle East and North Africa.

Server
In file systems, the server is a computer with large memory capacity that client machines can access and make use of these resources. In window systems, the server is a process that provides windowing services to an application, or client process. In this model, the client and the server can run on the same machine or on separate machines.

Service provider
An organization that provides connections to a part of the Internet.

Show Me Missouri Project
A mosaic application that provides MOREnet and Internet users with knowledge of Missouri's economic assets. This project is under construction by the Missouri Department of Economic Development.

Slow-scan TV
A telephone-based technology that captures still-frame pictures and displays them on television monitors.

Software
Written or printed data that is essential to the operation of computers.

T-1 channel
A high speed digital carrier with a bandwidth of 24 voice channels.

T-1 transport (DS1)
A digital carrier capable of transmitting 1.54 megabits per second of electronic information, equivalent to 24 telephone lines.

Tech Prep Education (Tech Prep)
A statewide initiative to develop strong comprehensive linkages among secondary schools and postsecondary educational institutions for the development and implementation of at least four-year programs (two secondary + two postsecondary) designed to provide a two-year associate degree or apprenticeship program that focuses on highly skilled technical occupations.

Telecommunications
The transmission, emission or reception of signs, signals, writing, images or sounds or intelligence of any nature by wire, radio or any electromagnetic systems, either one-way or between users at distinct geographic locations.

TELNET
An Internet application program that allows you to log in to another computer system using the TELNET protocol.

Touch-tone signaling
The sending of signals between a telephone exchange and subscriber terminal equipment such as a telephone using musical tones.

Transponder
A satellite channel used for receiving and retransmitting signals.

Uplink
The ground equipment, including a dish and other electronic components, used to transmit signals to a satellite.

Veronica
A service, very similar to Archie, that is built into Gopher. Veronica allows you to search all Gopher sites for menu items (files, directories, and other resources).

VHS (Video Home System)
A one-half-inch videotape cassette format originally developed and standardized by JVC.

Video server
A magnetic or optical storage system that records digital video signals for playback.

Video telecommunications system, one-way
A telecommunications system with the capacity to transmit video signals only from an origination site to receive sites.

Video telecommunications system, two-way
A telecommunications system with the capacity to transmit video signals between all sites.

Video-on-Demand
The delivery of digital movies via cable, telephone, or wireless where the user has the ability to start and stop the movie at any time.

Video
An electronically transmitted image displayed with a TV monitor. It includes full-motion, compressed, or freeze-frame formats.

Videoconferencing
Interactive video communications between individuals or groups at three or more locations.

Virtual reality
An advanced user interface that connects the visual and sensory human processes to 3D graphical computer systems.

Voice channel
The bandwidth of an electronic signal necessary to transmit ordinary voice communication.

Western Missouri Educational Technology Consortium (WeMET)
An interactive compressed video network. One of the distance learning trial networks established by the Public Service Commission on Interactive Learning. It connects Central Missouri State University at Warrensburg with high schools in Clinton, Holden, Pleasant Hill, and Warrensburg.

Wide Area Network (WAN)
A group of interconnected LANs extending the geographic scope of LAN capabilities.

Window system
A system that provides the user with a multi-use environment on the display device. Separate windows are like separate displays on the monitor screen. Each window can run its own application. The user brings up some number of windows for various applications, and the window system handles the communications between each of the applications and the hardware.

Wireless
The transmission of analog or digital signals without the use of a physical connection.

World Wide Web (WWW)
A hypertext-based system for finding and accessing Internet resources

Bibliography

_____.(1990, July). *Missourians Prepared—Success for Every Student.* Jefferson City, MO: Missouri State Board of Education.

_____. (1990, October). *A Road Map to School Improvement—The Report of the Missouri Technology Task Force.* A strategic plan for educational technology in Missouri. Columbia, MO: MSBA.

_____. (1995, January). *Goals 2000: An Invitation to Your Community.* Washington, DC: U.S. Department of Education.

_____.(September 1995) DRAFT. *Standards for Missouri School Library Media Centers.* Bonne Terre, MO: Missouri Association of School Librarians.

_____. (n.d.). Proceedings, Missouri Congress on Educational Technology, October 6-7, 1991. Osage Beach, MO.

Carnahan, Mel. (1994). *A Primer to the Outstanding Schools Act.* Jefferson City: Office of the Governor.

Carnahan, Mel. (1994).*The Missouri Report: Achieving the National Educational Goals.* Jefferson City: Office of the Governor.

Cheely, Catherine. (   ). "Search & Seizure Online: Using Your Modem to Find Grants. MultiMedia Schools." Point your gopher to: online.Lib.uic.edu The text of this article will be under the MultiMedia Schools Section.

Commission on informational technology. (1995, January 15). *Report to Governor Mel Carnahan and the Missouri General Assembly.* Jefferson City, MO: CIT.

Department of Elementary & Secondary Education. (1994, April). *Using Technology in Missouri's Schools—A Planning Guide.* Brochure. Jefferson City: DESE.

Department of Elementary & Secondary Education. (1994, September). *Overview of Missouri's Draft Academic Performance Standards and Curriculum Frameworks.* Jefferson City: DESE.

The Governor's Partnership on the Transition from School-to-Work. (1995, April). *School-to-Work: Missouri's Roadway to Success.* Executive Summary. Jefferson City, MO: Author.

Mecklenberger, James. (1993, Fall). "To Start a Dialog: The Next Generation of America's Schools." *Phi Kappa Phi Journal,* Volume LXXIII, No. 4, p. 40-43.

Mihalevich, J. Rick. (1994). "Technology and Learning: A Perspective!" Jefferson City: Author

Phillipo, John. (n.d.). "The Twenty-First Century School." Reprint shared by author. Marlborough, @: Center for Educational Leadership and Technology.

Reed, Patricia Hamilton. (1995). *Guide to Funding Databases & Resources On-Line.* Arlington, VA: Government Information Services

Sheingold, Karen & Tucker, Marc S. (1990, December). *Restructuring for Learning with Technology.* New York: Center for Technology in Education, Bank Street College of Education & National Center on Education and the Economy.

Existing Programs and Initiatives

Agency for Instructional Technology (AIT)
Barbara Rovalette, Television Marketing 800/457-4509 ext.236

Community Information Networks
Columbia On-line Information Network (COIN)
Ellinor Barrett, Contact 573/499-9474
Knightsnet—Farmington
Bill Bratberg, Contact 573/756-6631
Lebanon—Laclede Information On-line Network (LLION)
Greg Taunt, Coordinator 417/532-2117
MAGIC— Kansas City
Susan Burton, Contact 816/461-0966
Ozarks Regional Informational On-line Network (ORION)—Springfield
Kevin Tharp, Director 417/823-5050
Rolla-net—Rolla
Arlene Pagano, Contact 573/364-3424
Rural Area Information Network (RAIN)—Pilot Grove
David Jones, Ex. Vice President 816/834-3311
Westplex Information Network (WIN)—St. Peters
Voice Message 314/922-1730

Cooperating School Districts of Greater St. Louis (CSD)
Cal Owens, Asst. Executive, Educational Technology 314/872-8282

DESE Educational Technology Conference
Deborah Sutton, Director,
Special State Instructional Programs 573/751-9094

Educational Satellite Network, (ESN)
Missouri School Board Association
Jeanie Rhoades, Contact 816/445-9920

Harmon Industries Project (Blue Springs & Warrensburg)
Neva Allen, Coordinator, Educational Partnership 816/429-7726

I-TV Networks
Callaway-Audrain-Montgomery County Consortium (CAM-Net)
Charlotte Bakers, Supt., Community R-VI 573/492-6222
Education Plus Network (EPN)
Nancy Steele, Network Director 816/947-3361
Educational Telecommunications of Missouri Consortium (ETOM)
Joan Kruson Davis, Coordinator 816/543-4155
Mo Interactive Telecommunications Education Network (MIT-E)
Vicki Hobbs, Network Director 573/445-4940
Missouri Alliance for ITV
Northeast Missouri Network (NEMO Net)
Dan O'Donnell, Supt., Scotland Co. R-I 816/465-8531
Rural Ozarks Distance Education Consortium (RODEC)
Leon Cunningham, Supt., Verona R-VII 417/498-6418
Sikeston I-TV Network
Bob Buchanan, Supt., Sikeston 573/472-2581
St. Louis City Schools
Philip Brody 314/776-1644
Western Missouri Educational Technology Consortium (WeMET)
Mike Jeffries, Network Director 816/747-7823

ITV Training Institute
Scott Christianson, Director 816/248-1148
Central Methodist College

Missouri Association of School Librarians (MASL)
Stephanie Vergara, Service Agent.. 573/358-1053

Missouri Cable Television Association (MCTA)
Charles Broomfield, Exec. Director 816/453-3392

Missouri Research and Education Network (MOREnet)
Bill Mitchell, Executive Director 573/884-7200

MORE-Tech
Michael Dyrenfurth, Contact.. 573/882-2782
University of Missouri-Columbia

Missouri Supporting Teachers Project (MOST)
Jim Laffey, Contact 573/882-5399
University of Missouri-Columbia

Office of Information Technology
Jan Grecian, Contact 573/526-7741

Public Broadcasting Systems (PBS)
KCPT - Kansas City
Michael Connet, Vice President, Educational Services 816/756-3580
On-Line Instructional Video Resources Network (OLIVR)
Terry Rinehart, Educational Services Mgr.
National Teacher Training Institute
KECT - St. Louis
Patricia Kistler, Contact... 314/512-9133
KMOS - Warrensburg
Joan K. Davis, Inst. Television Coordinator 816/543-4155
Educational Telecommunications of Missouri (ETOM)
Joan Kruson
Mathline-Middle School Project
KOZK/KOZJ—Springfield/Joplin
Donna Swick, Director, Educational Services 417/865-2100

Regional Consortium for Education and Technology (RCET)
Mid-Missouri (Columbia)
Cynthia Scheiner, Coordinator 573/886-2874
St. Louis
Carl Hoagland, Director 314/872-8282
Southwest (Springfield)
Julie Holloway, Director 417/895-2722

Regional Professional Development Centers, (RPDC)
Region 1- SEMO Cape Girardeau
Cathy Evans, Director 573/651-2479
Region 2- UMC Columbia
Paul Pitchford, Contact 573/882-0859
Region 3- UMKC Kansas City
Kathy Jensen, Director 816/235-5627
Region 4- NMSU Kirksville
David Bethel, Director 816/785-7429
Region 5- NWMSU Maryville
Joyce Flowers, Director... 816/526-1502
Region 6- UMR Rolla
Thomas Deering, Director.. 573/341-6473
Region 7- SMSU Springfield
Karen Evans, Director 800/735-3702
Region 8- UMSL St. Louis
Jerry Melton, Contact 314/576-3535
Region 9- CMSU Warrensburg
Gene Vinson, Director 800/762-4146

TEAMS distance learning program
Rochelle Sadler, Missouri TEAMS Coordinator 573/526-7595

Technology Center for Special Education, UMKC
Frankie Dissinger, Director 800/872-7066
816/235-1040

Resources

GRANTS AND FUNDING

The contacts presented in this list are a small sample of the resources available. They are offered as a starting point and are not to be an endorsement of a service or product. The contacts are as current as possible, however the list is most certainly subject to change and revision.

Hewlett-Packard Foundation
Roy Verley
Hewlett-Packard Foundation Director of Corporate Philanthropy
Mail stop 20AH, P.O. Box 10301
Palo Alto, CA 94303-0890
415/857-3053

K-12 Weekly Grants and Contests
Email to: edu-news@gnn.com
URL: http://nearnet.gnn.com/gnn/meta/ed/dept/news/grantcon.html

RSP Funding Focus on America Online
America Online keyword: rsp

Matsushita Electric Corporation of America
Corporate Contributions
Matsushita Electric Corporation of America
One Panasonic Way 3G-7
Secaucus, NJ 07094
201/392-4134

US Government Printing Office
Washington DC 20402
Ask for: Guidebook to Excellence: A Directory of Federal Resources for Math and Science Education ($18.00)

GTE Gift Program (up to $12,000) for Math and Science teachers
504 Carnegie Center
Room X-220 PO Box 6330
Princeton, NJ 08540

Mini Grants, Information and Freebies
http://www.c3.lanl.gov/~jspeck/mini-grants.html

A Grant Getter's Guide to the Internet
gopher://gopher.uidaho.edu:70/00/e-pubs/grant_getter_guide_to _the_internet

Web Sites
http://www.enc.org/other_grant.html
http://infoserv.rttonet.psu.edu/gweb.htm
http://www.einet.net/galazy/Reference-and-Interdisciplinary-Infromation Grant.html

U.S. Department of Education
Federal Grant Information
202/708-9495 or 202/708-7774

What I Should Know About Education Grants
gopher://gopher.ed.gob

National Guide to Funding for Elementary and Secondary Education
The Foundation Center
800/424-9836

PROGRAMS AND INITIATIVES

From Now On: The Educational Technology Journal
http://www.pacificrim.net

The Internet and Schools
http://sunsite.unc.edu/cisco/tracy-article.html

Computer As a Learning Partner
http://clp.berkeley.edu/CLP.html#top

Global SchoolNet Foundation
http://gsn.org/gsn/gsn.home.html

NASA IITA k-12 Internet Initiative
http://quest.arc.nasa.gov

Online Internet Institute
http://prism.prs.K12.NJ.US.70/0/WWW/OIIhome.html

National Science Foundation Directorate for Education and Human Resources
http://red.www.nsf.gov

National Science Foundation (NSF)
stisserve@nsf.gov
Your message should read: get stisdirm.txt FTP: FTP to stis.nsf.gov
Enter anonymous for the user name, and your e-mail address for the password.
Retrieve the appropriate file (i.e., filename.ext). You need index.txt first so you can look up what you want to access.

National Education Goals

By the year 2000:

School Readiness—

All children in America will start school ready to learn.

School Completion—

The high school graduation rate will increase to at least 90 percent.

Student Achievement and Citizenship—

All students will leave grades four, eight, and 12 having demonstrated competency over challenging subject matter, including English, mathematics, science, foreign languages, civics and government, economics, arts, history, and geography, and every school in America will ensure that all students learn to use their minds well so they may be prepared for responsible citizenship, further learning, and productive employment in our nation's modern economy.

Mathematics and Science—

United States students will be first in the world in mathematics and science achievement.

Adult Literacy and Lifelong Learning—

Every American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Safe, Disciplined, and Alcohol- and Drug-Free Schools—

Every school in the United States will be free of drugs and violence, and the unauthorized presence of firearms and alcohol will offer a disciplined environment conducive to learning.

Teacher Education and Professional Development—

The nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century.
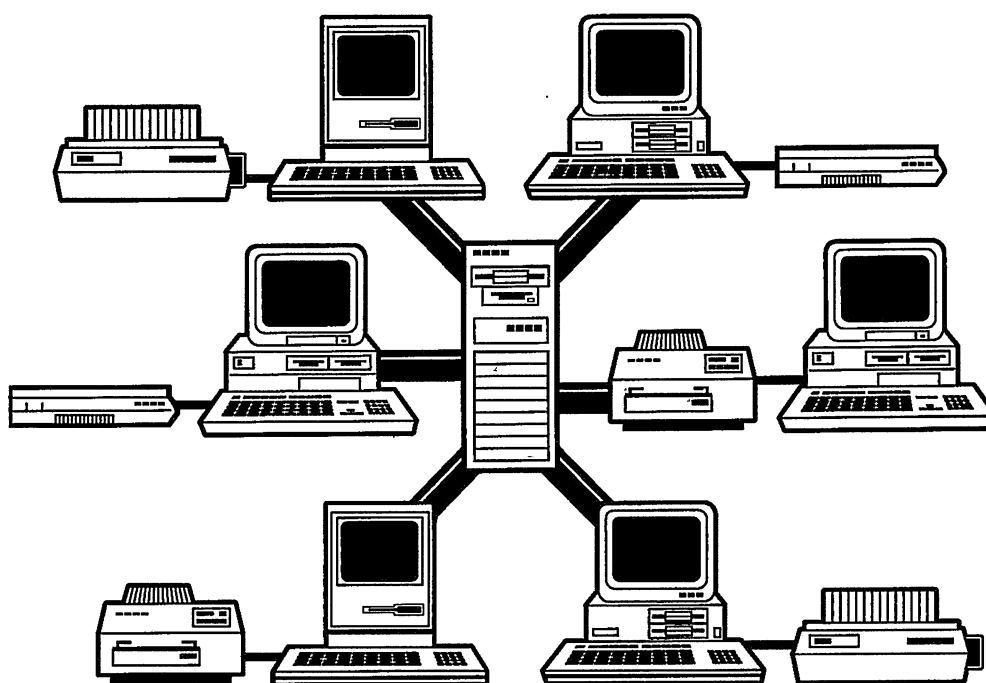
Parent Education—

Every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children.
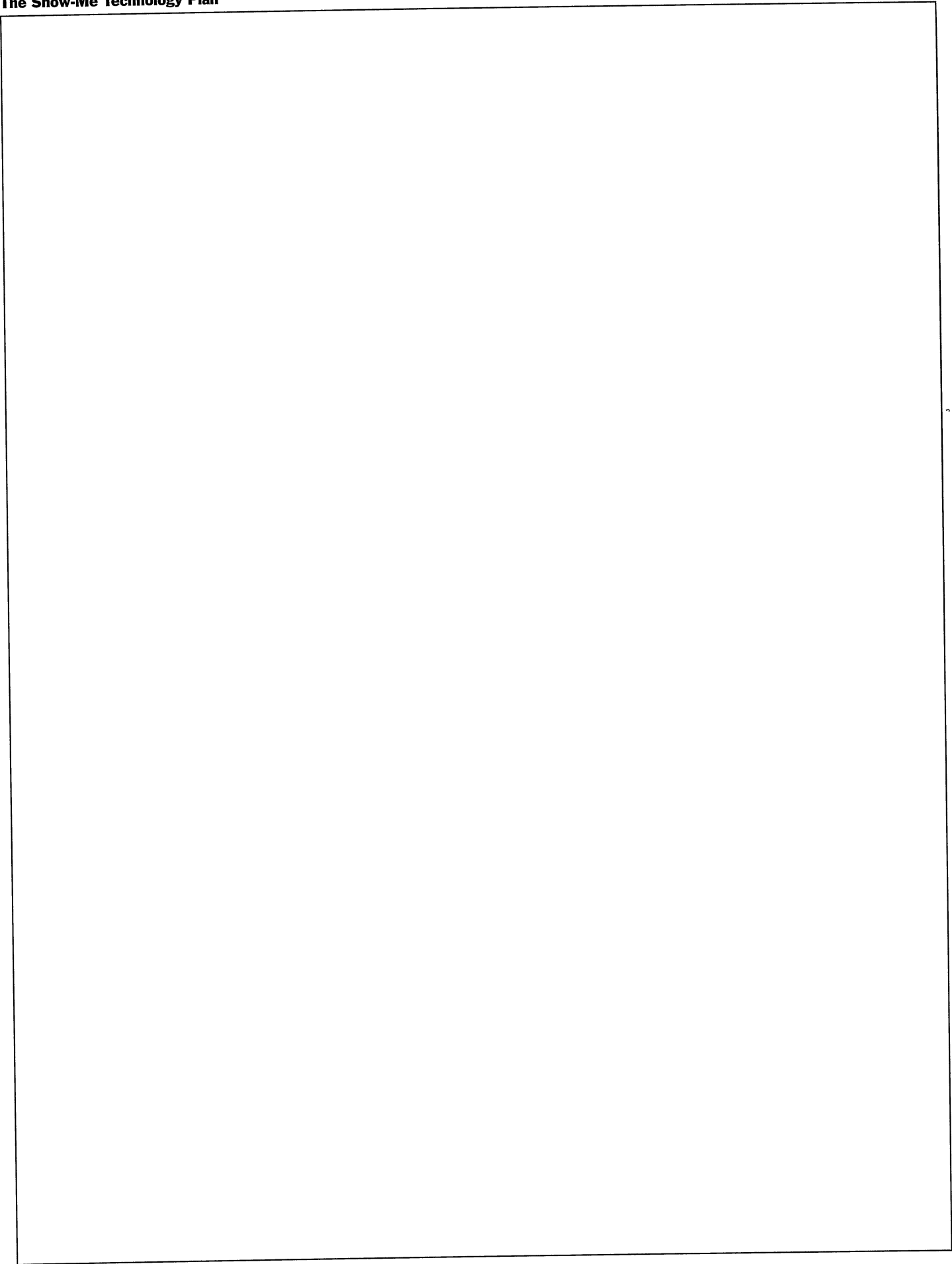
Using Technology in Missouri Schools —

A PLANNING GUIDE

April 1994
Missouri Department of
Elementary and Secondary Education
Robert E. Bartman, Commissioner of Education

Foreword

One of the goals of the Outstanding Schools Act of 1993 is to expand the use of technology in Missouri's public schools. The new law authorizes special grants to help school districts acquire new technology for instruction and management. The new law also earmarks funds for professional development activities (both at the state and local levels), and this provision can be a major asset in supporting technology-related training for school personnel.

The Department of Elementary and Secondary Education prepared this publication in an effort to assist school districts that are in various stages of providing technology for students and staff. Our staff used several sources in developing this guide — school districts of all sizes, consultants and technical experts. We have tried to compile ideas and suggestions that will help teachers and school district leaders develop effective, long-range plans for using technology in all aspects and levels of education.

This is not a "compliance manual." It is intended to provide helpful ideas and resources, regardless of your school's stage of development. Whether your district has one computer or one hundred, we think you will be better able to meet your needs and keep pace with fast-changing conditions if your district has a comprehensive technology plan.

Robert E. Bartman
Commissioner of Education

Steps for Developing a
District-wide Technology Plan

```
┌─────────────────────────────────────┐
│     Select Technology Committee      │
│              (Page 33)               │
└─────────────────────────────────────┘
                   ↓
┌─────────────────────────────────────┐
│     Determine Mission Statement      │
│              (Page 33)               │
└─────────────────────────────────────┘
      ↗                        ↘
┌──────────────────────┐  ┌──────────────────────┐
│ Implement & Evaluate │  │ Assess Current       │
│ Plan                 │  │ Technology           │
│      (Page 37)       │  │      (Page 34)       │
└──────────────────────┘  └──────────────────────┘
         ↑                          ↓
┌──────────────────────┐  ┌──────────────────────┐
│ Develop Technology   │  │ Analyze Data & Make  │
│ Action Plan          │  │ Recommendations      │
│      (Page 36)       │  │      (Page 35)       │
└──────────────────────┘  └──────────────────────┘
         ↖                          ↙
      ┌─────────────────────────────┐
      │      Establish Goals        │
      │         (Page 36)           │
      └─────────────────────────────┘
```
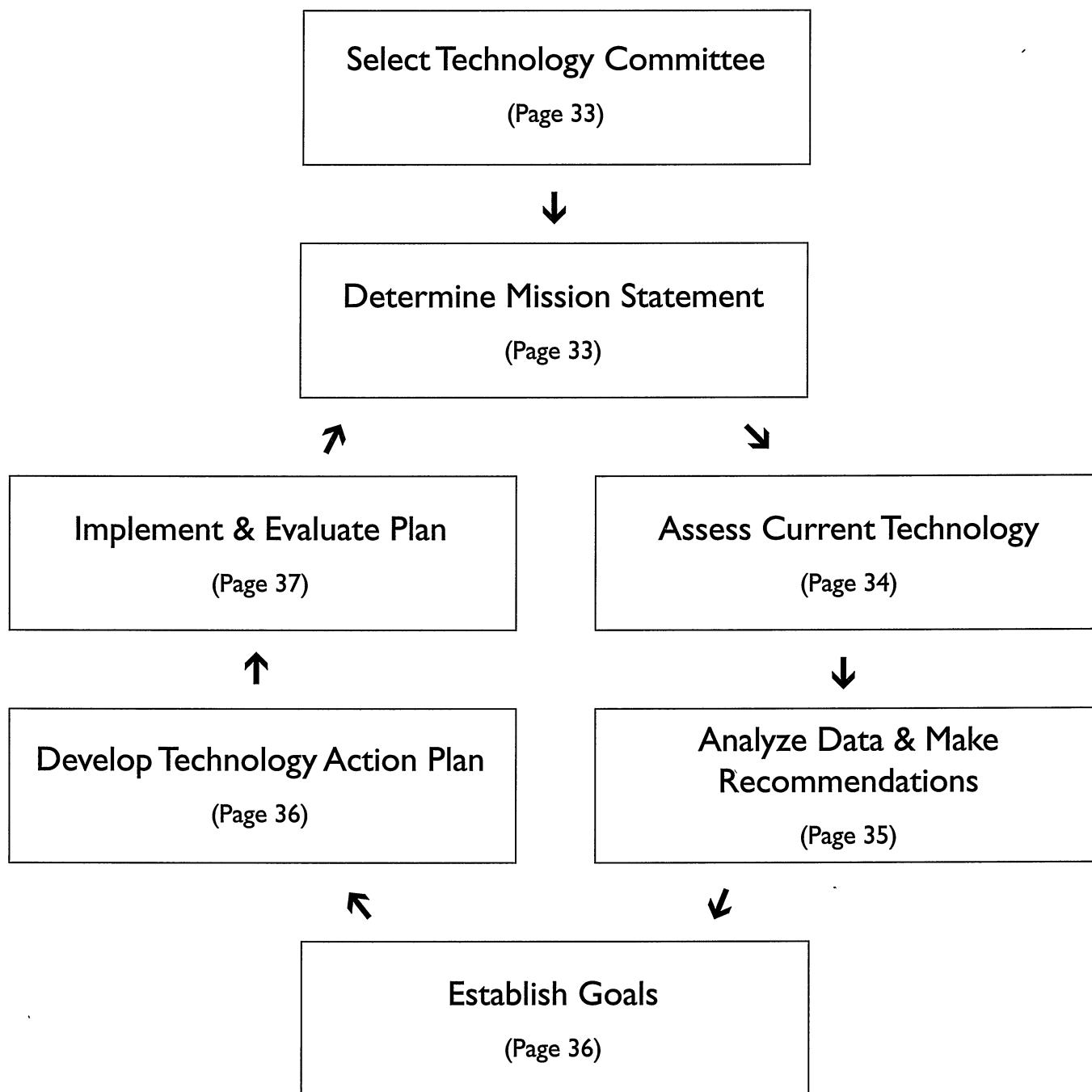
Essentials of Long-Range Technology Planning

1. Involve all crucial "stakeholders" in the planning process.

2. Allow sufficient time to develop the initial plan.

3. Remember: Technology planning is an ongoing process.

4. Develop your goals before you develop your action plan.

5. Use internal and external data to make adjustments in your plan.

6. Develop action plans that will get you to your strategic goals.

7. Manage your plan; don't just develop it.

8. Collect data and monitor the progress of your technology plan.

9. Involve others in developing and promoting your plan, including:
   - Faculty
   - Other school staff
   - Parents
   - Community leaders
   - Students

1. Select a Well-Rounded Technology Committee

The role of the committee is to identify a philosophy and rationale for the technology plan, conduct district needs assessments, create a technology blueprint, sell the plan and oversee progress. The selection of a fully representative committee helps ensure the selling of the final product and keeps lines of communications open. A strong technology committee can effectively leverage action, mediate disputes and help build consensus among members of the school faculty, administration and community.

The committee should represent the best expertise in the district. Members should include administrators, teachers, support staff, students, parents, board members and community/business leaders. If the district or the technology committee lacks expertise in certain areas, the use of outside consultants may be helpful.

- The technology committee should be a team of decision makers with a broad range of experiences.

- The technology committee should include representatives of each building, grade level, content or program area, and special-interest group.

2. Determine the District's Mission Statement Regarding Technology

The committee should be empowered to develop a policy for dealing with technology in the district. It should receive training/inservice in how technology can meet the changing needs of students and educators and help the school district respond to societal expectations. Then, the committee can identify the district's ideals and long-range goals in the form of a technology mission statement. (This mission statement, of course, must be compatible with the district's other existing mission statements.)

- Visit schools with successful technology programs.
- Ask vendors, university-based technology leaders and/or corporate specialists to present information to the committee about emerging

technologies and how such developments may affect teaching and learning.

- Develop a rationale for change and a vision for the future.
  — The district's stated goals and outcomes for technology must relate to and support desired curricular outcomes.
  — Technology planning involves more than reorganizing the curriculum and making plans to buy equipment.

3. Assess the Current Status of Technology in the District

The committee should form subcommittees or task groups to document the "who, what, where and why" of technology as it currently exists in the district. Analyze the school setting(s), learner characteristics, school and community resources, and perceived needs (current and future). Identify existing sources of information, and decide what data will need to be collected.

Determine the key technological issues at hand. Develop survey questions that will be submitted to teachers, administrators, clerical staff, students and parents. Be sure to get input from all stakeholders who will be using or affected by emerging technologies. The committee should conduct individual and group interviews to question school staff (and others) about current uses of technology, their attitudes about the potential for improving students' performance with technology, and their recommendations for implementing new technology.

Throughout the process of collecting data and conducting surveys, key issues to be considered by the committee should include:

- Board policy

- Funding

- Acquisition schedules and priorities

- Updating and maintenance of technology

- Potential applications for administration and management

- Potential applications for curriculum and instruction

- Equity

- Staff development and training

- Technology's place in the district's school improvement plan

- Office automation needs

- Student information and records

- Personnel (Will technology plans and goals require new staff?)

- Networking (within school buildings, among buildings, outside the district)

4. Analyze Data to Make Recommendations

Look at what is happening now. In light of the district's mission statement/vision, assess where the district wants to be. Assess the availability of technologies not used currently in the district. Look at the types of instruction in place now, what programs or methods are likely to be "imported" in the future, and how technology could support implementation of new programs.

Tips & Suggested Activities

- Review the existing uses of technology and media resources within the district and the relationship of these resources to the goals and objectives of the district's school improvement plan.

- Identify content areas and grade levels where technology learner outcomes will be achieved. (What technology concepts should be introduced, and where should they be introduced along the K-12 curriculum?)

- Identify specific areas where existing technology and/or new technology and media resources could support, enhance or expand the school improvement plan.

- Identify specific areas where technology is sought by teachers and staff.

- Identify strengths and weaknesses of the district's current uses of technology as well as potential opportunities or threats that exist outside the district that could affect technology planning and implementation.
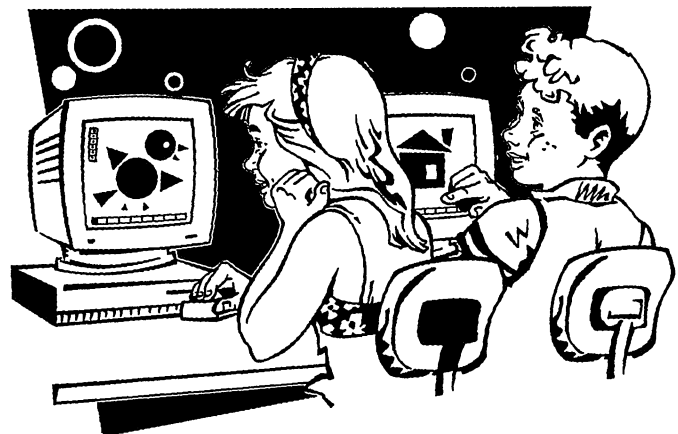
5. Establish Short- and Long-Range Goals

Compose, discuss and examine numerous goals; scrutinize each for clarity of purpose, attainability, measurability, appropriateness, and how it "fits" the district's mission statement. In the process of developing and clarifying the goal statements, keep in mind the potential implications that these goals may have on staff development activities, funding, and the district's current infrastructure.

Tips & Suggested Activities

- Develop a list of specific objectives for each goal.

- For each goal, determine how you will know when it has been achieved.

- Look at possible barriers to each goal. Brainstorm practical alternatives, and prioritize the goals accordingly.

- Develop a timelime for implementation, and assign responsibility for achieving specific goals.

6. Develop a Technology Action Plan

Creating a multi-year plan enables the committee to revisit the goals and to reassess priorities. A long-term plan also conveys the idea that technology requires more than a one-time influx of funding. The district's mission statement, educational objectives and desired outcomes should drive all purchasing decisions involving technology. The plan should be a solutions-oriented document, not just a "shopping list" of equipment. The action plan should address each building-level plan and cost estimates, the implementation schedule, and the resources needed to carry out the technology plan effectively. The plan should outline strategies and activities for developing staff members' understanding of technology and their abilities to apply it effectively. Finally, the action plan should specify how the impact of technology will be evaluated.

Tips & Suggested Activities

- Address key issues such as equity, facility needs, locations, security of equipment and data, staff development, leadership and budgets for technology.

- Develop a road map describing where you want to be in year one, year two, year three, etc.

- Consider compatibility issues when considering hardware and software purchases.

- Provide for accountability. Who will carry out various parts of the plan? How will you know or decide if technology is having a measurable or positive impact on students and/or staff?

- Provide for communication about the goals and progress of the technology plan. How and when will you communicate with district personnel, school patrons and the community?

- Provide for the continuous review and evaluation of the district's technology plan; be prepared to update and change the plan as often as required to reflect changing conditions or needs.

7. Implement and Evaluate the Technology Action Plan

Create ownership in the final product by including all committee members in the formal presentation of the plan. By increasing the number of people who are advocates for the plan, the chance for successful adoption is enhanced. Continually evaluate the effectiveness and validity of the plan. Monitor the success of your methods and activities and your progress toward the goals and objectives of the plan.

Tips & Suggested Activities

- Keep staff and the community informed and enthusiastic about new technology. Promote ownership and commitment by teachers as well as support from the school board, administration and community.

- Consider employing a part- or full-time technology director — perhaps a faculty member who is respected throughout the school community and who has a fair amount of expertise in the use of technology.

- Consider going through a request-for-proposals (RFP) or bidding process to select a single vendor for equipment and related services. Make sure potential vendors understand your district's needs and the differences between business and educational applications. Get references about prospective vendors from other schools. Be sure that the specifications in your RFP include all potential costs: equipment/hardware, software and software licenses, cables, wiring, installation, product upgrades, product warranties, service and maintenance, telephone support and training.

- Acquire technology incrementally and integrate it gradually into the curriculum.

- Set up pilot sites for the first-year implementation phase. Begin by giving the technology resources to the teachers who are most eager to make an investment in using them. Offer incentives to teachers who offer exemplary models. Based on experiences gained in the pilot or initial stage, add other schools/programs.

- Develop a deliberate training schedule that allows teachers time to explore and investigate the technology.

- Establish a "buddy teacher" or "buddy school" system to encourage staff to share ideas, frustrations and successful practices.

- Continue to develop and expand technology-related training efforts. Customize training activities to match the needs, inclinations, schedules and experience levels of participating staff members.

- Emphasize technology awareness and expertise when hiring new staff.

- Whenever the district plans to submit bond issue proposals to voters, consider including some amount of money for technology in the proposal.

- Continually review, revise and expand the technology plan. Conduct both summative evaluation (Should a program be continued or terminated?) and formative evaluation (Does a current program or activity need to be adjusted or redirected?). At the very least, review the plan annually and prior to any major purchase of hardware or software.

- Modify parts of the plan — or the entire plan — when evaluation data indicate that there is a need to redirect or redeploy available resources to meet desired instructional goals or implementation timelines.

Information about District-Level Technology Plans

In preparing this guide, staff members of the Department of Elementary and Secondary Education solicited ideas and sample technology plans from several Missouri school districts, including those listed below. Readers may want to contact the individuals listed here to request samples of plans and other materials which these districts have prepared.

Carrollton R-VII School District
Ron Landis, Library Media Specialist
300 East Ninth Street
Carrollton, MO 64633-2342
816/542-3559

Fulton School District
Dennis McElroy, Technology Director
2320 North Bluff
Fulton, MO 65251-2731
573/642-2206

Gideon School District
David Hollingshead, Technology Coordinator
400 Main Street
Gideon, MO 63848-0227
573/448-3911

Independence Public Schools
David Rock, Assistant Superintendent
1231 South Windsor
Independence, MO 64055
816/833-3433

Ladue School District
Elizabeth Schwartz, Assistant Superintendent
9703 Conway Road
St. Louis, MO 63124-1698
314/994-7080

Lee's Summit School District
Sharon Early, Library Media Coordinator
600 SE Miller
Lee's Summit, MO 64063-4297
816/524-3368

Ritenour School District
Dwight Guerrant, Technology Coordinator
2420 Woodson Road
St. Louis, MO 63114-5499
314/426-9529

St. Louis Public Schools
Philip J. Brody, Director
Division of Technology
911 Locust Street
St. Louis, MO 63101-1471
314/776-1644

References

Dyrli, O.E. and D.E. Kinnaman. "Gaining Access to Technology: First Step in Making a Difference for Your Students," *Technology & Learning*, January 1994.

Dyrli, O.E. and D.E. Kinnaman. "Integrating Technology Into Your Classroom Curriculum," *Technology & Learning*, February 1994.

Dyrli, O.E. and D.E. Kinnaman. "Moving From Successful Classrooms to Successful Schools," *Technology & Learning*, March 1994.

Farrell, R. and S. Gring. "5 Steps Toward Planning Strategically," *Media & Methods*, January/February 1993.

Hanson, G. "Planning for Distance Learning in the K-12 Classroom," presented in a pre-conference workshop at the Eighth Annual Conference on Distance Teaching and Learning, 1992.

Kearsley, G. and W. Lynch. "Examples of Technology Leadership Skills," *Journal of Research on Computing in Education*, Fall 1992.

Lumley, D. and G.D. Bailey. *Planning for Technology. A Guidebook for School Administrators*. New York: Scholastic, Inc., 1993.

Nassar, G., "Establishing a Technology Vision: Steps to Success," *School Executive*, February 1993.

Need More Information or Assistance?

This publication was developed by a committee of staff members from several sections and programs in the Department of Elementary and Secondary Education. It was written primarily by personnel in the Special State Instructional Programs Section (Division of Instruction). For more information or assistance with your district's technology-related activities, contact:

Deborah Sutton, Director
Special State Instructional Programs
Department of Elementary and Secondary Education
P.O. Box 480
Jefferson City, MO 65102-0480
573/751-9094

Technology Network Infrastructure Consulting

TECHNIC CATALOG

Based on the expressed needs of superintendents and technology support staff, the Missouri Research and Education Network (MOREnet) formed the Technology Network Infrastructure Consulting (TECHNIC). TECHNIC will provide support and consultation services for K-12 educators in school districts participating in the Department of Elementary and Secondary Education (DESE) Technology Network Program (TNP).

The DESE TNP brings the Internet to a single point in a school district and leaves the task of spreading Internet access within the district to local officials. To assist in disseminating network access, DESE broadened the TPN to include TECHNIC.

TECHNIC provides administrators and technical support staff with technology guides and resources for the installation and upkeep of advanced telecommunications technology. This support enhances Missouri's investment in connecting public institutions to the Internet.

SUPPORT MODEL

TECHNIC employs the support model currently in use by the DESE TNP. Each school district should appoint two technical support staff to work with TECHNIC. Questions from individual teachers or building support staff should be forwarded to the district technical support staff contact for a response. If the district technical support staff cannot resolve the problem, help may be obtained from TECHNIC.

SUPPORTING DISTRICT STAFF

A new e-mail discussion list is available for district technical support staff to share and discuss infrastructure issues. The district technical support staff contacts will be sent an information packet and subscribed to this list by TECHNIC.

CONTRACT INFORMATION

Contact Person:	Dr. James Newton
E-mail:	jim@more.net
Phone:	573/884-7200
U.S. Mail:	MOREnet TECHNIC
	1805 East Walnut
	Columbia, MO 65201
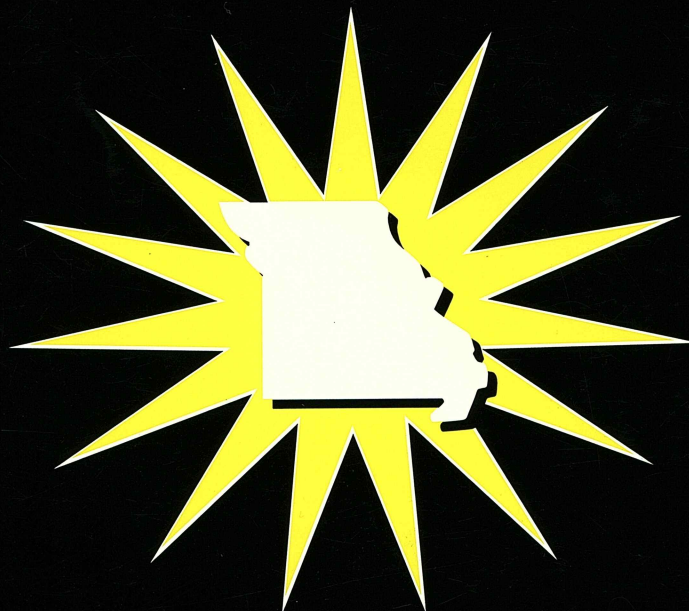
For more information, contact:

Assistant Director, Goals 2000

Missouri Department of Elementary and Secondary Education

P.O. Box 480 • Jefferson City, MO 65102-0480

Telephone: 573-526-3232 • *Fax:* 573-751-9434

E-mail: fedpro@mail.dese.state.mo.us